

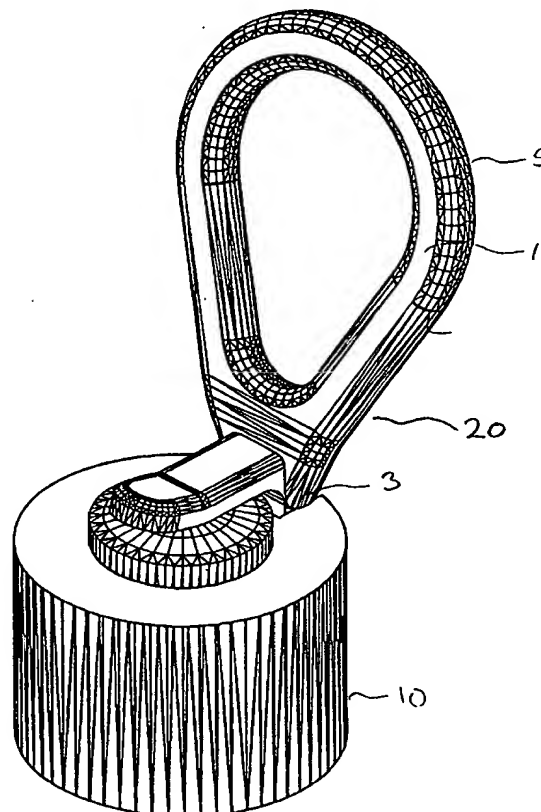


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/DK99/00485 (22) International Filing Date: 15 September 1999 (15.09.99) (30) Priority Data: PA 1998 01206 24 September 1998 (24.09.98) DK (71) Applicant (for all designated States except US): MICROTRONIC A/S [DK/DK]; Byleddet 12-14, DK-4000 Roskilde (DK). (72) Inventor; and (75) Inventor/Applicant (for US only): JØRGENSEN, Martin, Bondo [DK/DK]; Lupinhaven 36, DK-2765 Smørum (DK). (74) Agent: PLOUGMANN, VINGTOFT & PARTNERS A/S; Sankt Annæ Plads 11, P.O. Box 3007, DK-1021 Copenhagen K (DK).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>

(54) Title: A HEARING AID ADAPTED FOR DISCRETE OPERATION**(57) Abstract**

The present invention relates to a hearing aid, which allows a hearing aid user to discretely operate his/her hearing aid by applying a force to a portion of the ear carrying the hearing aid. A number of different functions of the hearing aid, such as turning a battery supply on/off, adjusting a volume control, selecting a particular pre-programmed listening program, etc., may be provided in a hearing aid according to the present invention—all without directly engaging the hearing aid or switches or potentiometers thereof. Furthermore, if the hearing aid is adapted for use within the ear canal, the present invention may provide user assistance so to allow simple and convenient removal of the aid from the ear canal.



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A HEARING AID ADAPTED FOR DISCRETE OPERATION

FIELD OF THE INVENTION

- 5 The present invention relates to a hearing aid, which may be operated discretely by applying a force to the ear or its surroundings. A number of different functions of the hearing aid, such as turning a battery supply on/off, adjusting a volume control, shifting between a microphone and a telecoil input signal, etc., may be chosen or selected in the present hearing aid – all without directly engaging the hearing aid or switches or
- 10 potentiometers thereof. Also, when the hearing aid is adapted for use within the ear canal, an easier removal thereof is provided.

BACKGROUND OF THE INVENTION

- 15 Hearing aid technology continuously strives toward developing smaller hearing aids or hearing instruments. This development is helped by a continuous reduction in size for all components commonly utilised in hearing aids.

The advent of in-the-canal (ITC) type of hearing aids and completely-in-the-canal (CIC) type of hearing aids has brought several benefits to hearing aid users. Many users or

20 potential users find it cosmetically attractive to wear an aid that may be completely contained within the ear canal, since this renders the aid invisible, at least in a majority of everyday situations.

- 25 Further, hearing aids of the ITC and CIC types provide acoustical benefits compared to a behind-the-ear (BTE) type of instrument. One benefit is improved directional hearing due to a major part of the outer ear being left unblocked by the ITC and CIC hearing aids, thereby preserving the natural directional properties of the outer ear.

- 30 While the cosmetic and acoustic improvements related to the use of ITC and CIC hearing aids are well recognised, there remain a number of practical problems related to the daily use and operation of these types of aids.

A hearing aid is usually provided with one or several control means, such as push

35 buttons, switches, etc., which may be located on a face part of the hearing aid housing.

The control means may be adapted to provide a number of functions, such as turning the aid on/off, controlling a gain, changing between a number of predetermined listening programs, changing between a microphone signal and a telecoil signal, etc.

- 5 A first practical problem is the difficult operation of controlling means mounted on the face of the housing of the hearing aid. This problem originates from e.g. the inaccessible position of the hearing aid deep inside the ear canal, which normally makes it difficult for a user to find and properly operate the controlling means. The very limited available area of the face part of the aid further adds to this problem, since any controlling means must
- 10 have very small physical dimensions to fit on the face of the housing. This problem is pronounced for elderly people, which constitute the majority of hearing aid users, since they often have reduced capability to perform the necessary tiny movements of the controlling means with their fingertips.
- 15 A second problem is that it may be very difficult for the user to remove an ITC and especially a CIC type aid from its clamped-in position in the ear canal.

A solution to the problem of removing the aid is disclosed in US 5,381,484 wherein a pull-out string with beads is attached to a face part of a housing of a CIC aid. The beads

20 provided on the string enables the user to get a firm grip on the string and apply the force necessary to release the aid.

This solution, however, creates a derived third problem, since, during the release process, an acoustic leakage path is inevitably created in the ear canal between the microphone

25 mounted on the face part and a sound emitting transducer (receiver) of the hearing aid. This leakage path will usually make the hearing aid oscillate at a high frequency and at full output power, producing a sustained and highly irritating noise into the ear of the user until the battery supply is turned off, or the gain is turned down. Also, a string pointing out of the ear is not desirable for cosmetic reasons.

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SUMMARY OF THE INVENTION

It is an object of the invention to solve these two above mentioned basic problems and the third derived problem.

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In a first aspect, the invention provides a hearing aid comprising a housing and means for controlling an operation mode of the hearing aid, wherein said controlling means are adapted to be responsive to a force applied to a part of an auricle of the hearing aid user.

5 Thus, the hearing aid may be operated by applying a force to a part of the outer ear instead of manipulating small switches or control buttons mounted on the face part of the hearing aid, when the aid is positioned e.g. inside the ear canal. This operation method may replace all or at least some of the functions traditionally provided by control switches and push buttons on the face part of the hearing aid.

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In this manner, a more discrete and convenient operation of the hearing aid is obtained.

Thus, the hearing aid user may operate the hearing aid by applying a pressure with his/hers finger to a predetermined part of the outer ear. As will be clear from the following,
15 different types of hearing aids may be adapted to use different parts of the ear.

In one embodiment, the hearing aid is of the BTE type, where the housing is adapted to be placed at a position behind the ear, and wherein the controlling means comprise sensing means positioned on at least one side of the hearing aid housing facing the head
20 or facing the ear lobe of the user, the sensing means being adapted to sense a force applied to the user's auricle, and the controlling means being responsive to the sensing of the sensing means. In this embodiment, the predetermined part of the outer ear may be the tail of the helix. The sensing means may, in this situation, be mounted on a side of the BTE housing, in such a manner that the means senses the applied force.

25

In another embodiment, the housing is adapted to be placed within the ear canal, which is the case for hearing aids of the CIC or ITC type. In this situation, the predetermined part of the auricle that receives the applied force may be the tragus.

30 In this embodiment, the controlling means preferably comprise a stiff lever having two ends, a first end, which may be attached to a switching means or a face part of the housing. The lever, further, being adapted to be deflected by application of the force to the auricle, such as to a tragus, of the ear, and the controlling means being responsive to the deflection of the lever

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Thus, the lever preferably possesses a suitable stiffness to transfer at least a part of the applied force to the controlling means. Preferably, a second end of this lever is placed within the ear canal at a position in close proximity to e.g. the inside part of the tragus of the user's ear.

5

Since the dimensions and colours of human ears vary widely, it may be advantageous to produce a number of levers in different lengths and colours. Further, due to these anatomic variations, it may be advantageous to provide the levers with a number of different mounting angles between the face plate of the hearing aid and the lever, the
10 angle variation, preferably, being restricted to the range from 60-120 degrees.

In the situation wherein a number of different levers are provided, the hearing aid may be manufactured with a detachable connection between the hearing aid housing and the lever. The place at which the hearing aid is fitted to the user, often a dispensing office,
15 may stock a number of levers of differing lengths, colours and mounting angles. The fitting procedure at the dispensing office may include the step of selecting the size and/or the shape and/or the mounting angle of the lever to properly position it in close proximity to e.g. the tragus of the user's ear. The lever may, thereby, be adequately deflected from its rest position, when a force is applied to the tragus, and a response may be generated in
20 the controlling means.

Also, hearing aids of the CIC or ITC types may be shaped on the basis of the actual shape of the ear canal of the user. In this process of moulding the outer contours of the hearing aid, the shape of the lever may be determined or selected – or even custom
25 made.

Also, the stiff lever may be used for a second purpose. The lever may further be adapted to assist the user in removing the hearing aid from the ear canal. Thus, preferably the lever further comprises engaging means adapted to facilitate engagement with the
30 hearing aid during removal. Naturally, this removal may be performed by the user using his/her fingers or by using a tool. Especially when a tool is used, it is preferred that the engaging means comprise a loop-shaped or hook-shaped part.

A major advantage of using the present lever is the fact that it is at least relatively stiff,
35 which means that the engaging means will remain in at least substantially the same,

predetermined position during normal use and movements by the user. In this manner, the position thereof is well known and removal of the hearing aid easier. Also, when using an extraction tool, the engaging means may be positioned farther (and, thus, more invisible) into the ear canal than if they were to be engaged by a finger of the user.

5

The engaging means are preferably shaped so that the lever is provided with a loop-shaped outline and being suitable for mass production through the use of an injection mould. The loop-shaped outline is advantageous since it provides a firm grip for the fingers of the hearing aid user, thereby helping him/her to release the hearing aid from the ear canal without the use of extraction tools.

The exact manner in which the deflection of the lever is detected and used by the controlling means to control the manner of operation may differ widely. However, preferably the controlling means comprises a switching means, such as an on/off switch, a momentary switch, etc. adapted to control the operation mode of the hearing aid, the switching means being responsive to the deflection of the stiff lever.

In the situation where the controlling means are provided with a momentary switch, the switch element is, preferably, responsive to an applied force of between 0,5 - 5,0 Newton, even more preferably around 0,8 Newton. The term "being responsive to" means that the switch element will change from one state to another state.

Thus, the lever is, preferably, provided with a stiffness sufficiently large to convey a pressure force of at least 0,8 Newton, or more preferably at least 5,0 Newton to the switch element. A suitably constructed lever will convey the pressure force to the switch element, if the force is applied along the length axis of the lever or if the force is applied perpendicularly to the length axis of the lever.

The stiffness of the lever will, of course, depend on its shape and its dimensions, such as its length, as well as the type of material used for it.

The stiffness of the lever may be tested by selecting a 5 mm long lever and at the first end provide a fixed restraining of the lever, and subsequently applying a force of 0,8 N at the second end of the lever where the force is applied substantially perpendicularly to the length axis. Subsequently, the deflection of the second end, resulting from of the applied

pressure, is measured. A 5 mm long lever suitable for application in the present invention has, preferably, a deflection within the interval 0-5 mm, more preferably within the interval 0-2 mm, even more preferably within the interval 0-1 mm.

- 5 The deflection of the lever is measured in its least stiff direction, if the lever is unsymmetrical about the length axis.

- The lever is, preferably, provided with a length, l_g , within the interval 4-10 mm. The stiffness of the lever of any of these lengths may be tested as described above, and the
- 10 deflection is, preferably, within the interval $0-1.0 \cdot l_g$ mm, more preferably within the interval $0-0.4 \cdot l_g$ mm, even more preferably within the interval $0-0.2 \cdot l_g$ mm.

- The lever is, preferably provided in metal or a thermo-plastic material, but a lever of adequate stiffness as defined above, may be provided in a large variety of materials,
- 15 dimensions and shapes.

- Thus, the switching means may be mechanically connected to the stiff lever, and a force applied to e.g. the tragus of the user's ear will cause the switching means to change its state. This change of state may be sensed by the controlling means, and as a response
- 20 the controlling means may change the operation mode of the hearing aid.

- Measurements, performed by the inventor, on ears of a variety of individuals have revealed that a force applied to the tragus in the range of 30-50 grams, equivalent to 0,3-0,5 Newton, will displace the tragus with approximately 0.5 - 1.0 cm from its rest position
- 25 on an average individual.

In response to this deflection of the tragus, the lever may be deflected and thereby convey a sufficient part of the applied force to the switching means to change its state.

- 30 The momentary switch may be one, which provides two different states. The states may be provided as a first state wherein two legs of the switch are shorted and a second state wherein the two legs are open i.e. having a substantially infinite resistance between them.

- The two states of the switch may further be provided as a corresponding electrical signal
- 35 representing these states, such as zero (ground) signal and V_{bat} (positive power supply)

signal, and this electrical signal may be sensed by the controlling means, thereby providing a hearing aid wherein the switching means are adapted to alternate an electrical signal level between two predetermined levels, the controlling means being adapted to control the operation mode in response to a change in the electrical signal level provided
5 by the switching means.

The controlling means may comprise an integrated circuit, such as a CMOS circuit, a Bipolar circuit, a BiCMOS circuit, etc. The integrated circuit may, further, comprise logic means adapted to control the operation of the hearing aid.
10

In one embodiment, the electrical signal provided by the switching means is adapted to control the battery supply on/off operation mode of the hearing aid. This embodiment is particularly well suited for CIC hearing aids, since these aids, by their nature, are located deep inside the ear canal where it is difficult for the user to locate and operate traditional
15 switches or push buttons. The present invention provides a better solution for the hearing aid user to this tedious switching operation, since the invention may provide a CIC hearing aid wherein the battery supply on/off is controlled by depressing the tragus of the ear.

In another embodiment, the controlling means may be adapted to control a
20 microphone/telecoil input signal selection from the change in the electrical signal level provided by the switching means.

In yet another embodiment, the controlling means are adapted to select a particular pre-set listening program between a number of pre-set listening programs comprised in the
25 hearing aid. An EEPROM in the hearing aid may comprise several different listening programs that have been selected and subsequently loaded into the EEPROM at a dispensing office.

In the situation where the switching means comprises a momentary switch and the
30 controlling means further comprises an integrated circuit, the operation mode change of the hearing aid may be activated only after the tragus has been depressed during a predetermined time interval. This predetermined time interval may be controlled by the integrated circuit. By choosing a suitable time interval, accidental activation of the operation mode control may be prevented or minimised by "normally" occurring touches
35 and scratches of the tragus. In a second aspect of the invention, the controlling means

comprise a rigid lever with an engaging means that provides the hearing aid user with a firm grip, so that he/she may release the hearing aid from the ear canal. In this aspect, the invention relates to a hearing aid adapted to be positioned within an ear canal of an ear of a user, the hearing aid comprising means for manually removing the hearing aid from the
5 canal, the removing means being fastened to the hearing aid and extending from the hearing aid toward an auricle of the ear, and wherein the removing means comprise a stiff member adapted to remain in essentially the same predetermined position at least during normal movements of the user.

10 BRIEF DESCRIPTION OF THE DRAWINGS

In the following, a preferred embodiment of a controlling means according to the invention will be described for use in a CIC type of hearing aid, and in relation to the drawing wherein

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Fig. 1 shows a perspective view of a controlling means comprising a loop shaped stiff lever,

Fig. 2 shows a side view of the controlling means,

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Fig. 3 is an illustration of a CIC hearing aid comprising a loop-shaped stiff lever and mounted in an ear canal.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

25

Fig. 1 shows a perspective view of a controlling means 20, which is adapted for use in a CIC type of hearing aid. The controlling means comprises stiff lever 1 with a loop shaped outline 5, a switch unit 10 of the momentary type. The stiff lever is, preferably, manufactured in a metal or a thermo-plastic material, the latter may comprise
30 reinforcement. Both types of materials may provide a lever of suitable stiffness in the preferred shape or shapes. The loop-shaped lever constitutes an engaging means, and a part of the lever may be provided with a ribbed pattern, thereby providing the hearing aid user with an item that may be firmly gripped with the fingers and used to pull out the aid from the ear canal.

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The switch unit 10 comprises two gold-coated electrical contacts as seen on Fig. 2 items 30 and 31. This unit 10 may be attached to a face part of a hearing aid housing (not shown). The contacts 30 and 31 may be connected by means of electrical conductors to a control circuit (not shown) that may be comprised on a hearing aid printed circuit board 5 (not shown). The control circuit may sense the electrical signal on a single or both contacts to determine the state of the switch i.e. whether the switch is in its rest position or in its active position.

Preferably, one of the switch contacts 30 and 31 provides one of two different DC 10 voltages 0 volt and battery supply voltage (VBAT) to the control circuit depending upon the state of the switch.

Fig. 2 shows a side view of the controlling means 20 with the stiff lever 1 in a rest position. The arrow 25 indicates the direction to which the stiff lever 1 is deflected when a force is 15 applied to it. The stiff lever 1 is attached to the switch unit 10 by pivot pin 3. A circular flange 32 is further provided to securely fasten the controlling means 20 of fig. 1 to the face part of the hearing aid housing when a "pull-out force" is applied to the stiff lever 1.

When the deflection of the stiff lever 1, around the pivotal pin 3, is larger than 20 approximately 15 degrees, the electrical contact provided between contacts 30 and 31 in the rest position with zero deflection, is disconnected. This disconnection is sustained until the applied force acting upon the lever 1 is removed. When the applied force is removed, a spring (not shown) surrounding the pivotal pin 3 provides a force, which is adapted to move the stiff lever 1 back to its rest position, and thus the contacts 30 and 31 again into 25 electrical contact.

Fig. 3 shows a CIC type of hearing aid 35 mounted in an ear canal 40 of a hearing aid user. The aid comprises controlling means with a loop-shaped stiff lever 1, which is mounted in close proximity to a tragus 36 on an auricle 41 of the hearing aid user.

CLAIMS

1. A hearing aid comprising, a housing and means for controlling an operation mode of the hearing aid, characterised in that said controlling means are adapted to be responsive
5 to a force applied to a part of an auricle of an ear of a hearing aid user.
2. A hearing aid according to claim 1, wherein the housing is adapted to be placed at a position behind the ear, and wherein the controlling means comprise sensing means positioned on at least one side of the housing facing the head or facing the ear lobe of the
10 user, the sensing means being adapted to sense a force applied to the user's auricle, and the controlling means being responsive to the sensing of the sensing means.
3. A hearing aid according to claim 1, wherein the housing is adapted to be placed within an ear canal of the ear.
15
4. A hearing aid according to claim 3, wherein the controlling means comprise a stiff lever having two ends, one of which is attached to a face part of the housing, the lever being adapted to be deflected by application of the force to the auricle, such as to a tragus, of the ear, and the controlling means being responsive to the deflection of the lever.
20
5. A hearing aid according to claim 4, wherein the lever is adapted to also be used by the user to remove the hearing aid from the ear canal.
6. A hearing aid according to claim 5, wherein the lever further comprises engaging
25 means adapted to facilitate engagement with the hearing aid during removal.
7. A hearing aid according to claim 6, wherein the engaging means comprises a loop-shaped or hook-shaped part.
- 30 8. A hearing aid according to any of claims 4-7, wherein the controlling means comprises switching means adapted to control the operation mode of the hearing aid, the switching means being responsive to the deflection of the stiff lever.
9. A hearing aid according to claim 8, wherein the switching means comprises a
35 momentary switch.

10. A hearing aid according to claim 8, wherein the switching means comprises an on/off switch.

5 11. A hearing aid according to any of claims 4-10, wherein the stiffness of the lever is large enough to convey at least a pressure force of 5,0 Newton to the switch element.

12. A hearing aid according to claim 11, wherein the pressure force is applied perpendicular to the length axis of the lever.

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13. A hearing aid according to claims 9-12, wherein said switching means are adapted to switch an electrical signal between two predetermined levels, the controlling means being adapted to control the operation mode in response to a change in the electrical signal level provided by the switching means.

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14. A hearing aid according to any of claims 1-13, wherein the controlling means are adapted to control a power on/off operation mode of the hearing aid.

15. A hearing aid according to any of claims 1-13, wherein the controlling means are
20 adapted to select a particular pre-set listening program between a number of pre-set listening programs in the hearing aid.

16. A hearing aid according to any of claims 1-13, wherein the controlling means are adapted to control a telecoil/microphone operation mode of the hearing aid.

25

17. A hearing aid according to any of the preceding claims, wherein the controlling means further comprises an integrated circuit.

18. A hearing aid adapted to be positioned within an ear canal of an ear of a user, the
30 hearing aid comprising means for manually removing the hearing aid from the canal, the removing means being fastened to the hearing aid and extending from the hearing aid toward an auricle of the ear, characterised in that the removing means comprise a stiff member adapted to remain in essentially the same predetermined position at least during normal movements of the user.

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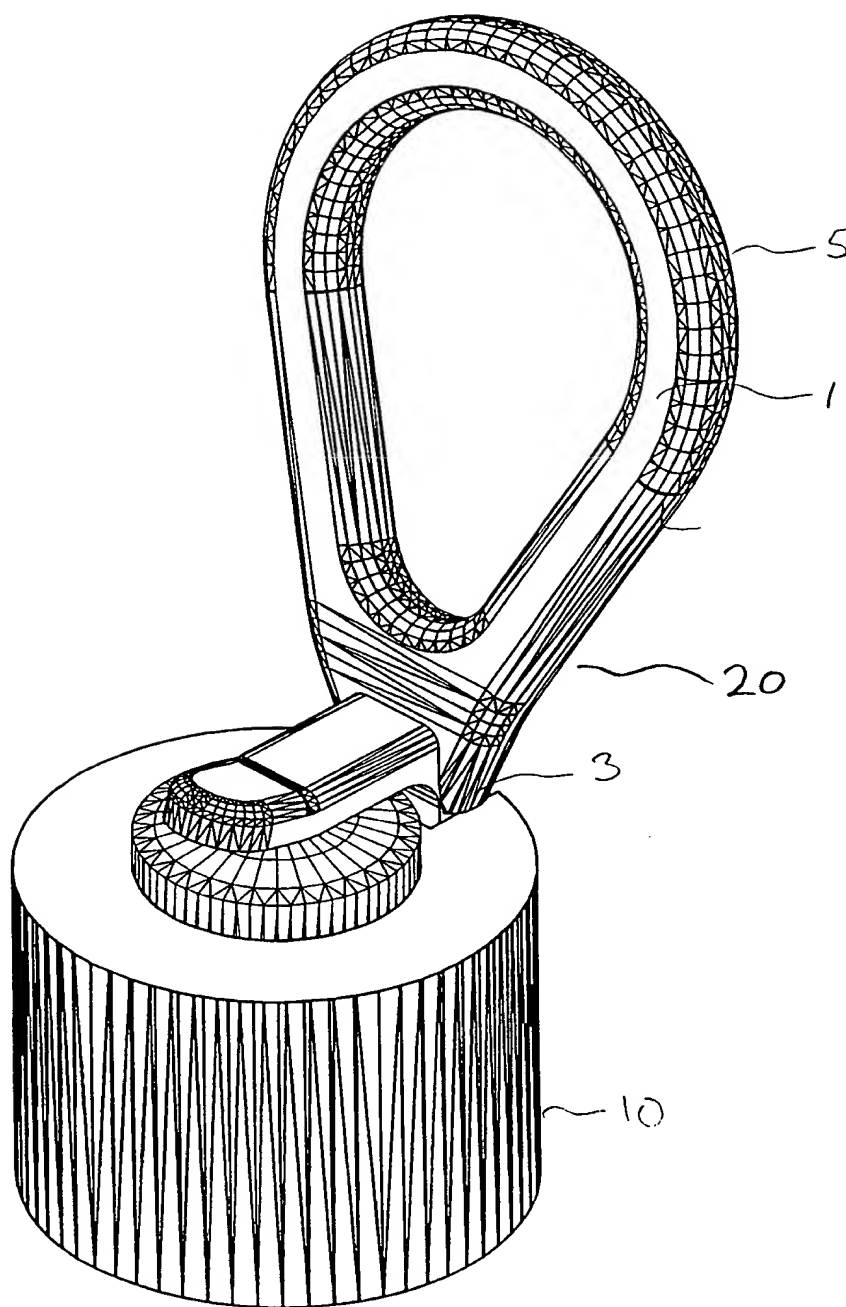


Fig. 1

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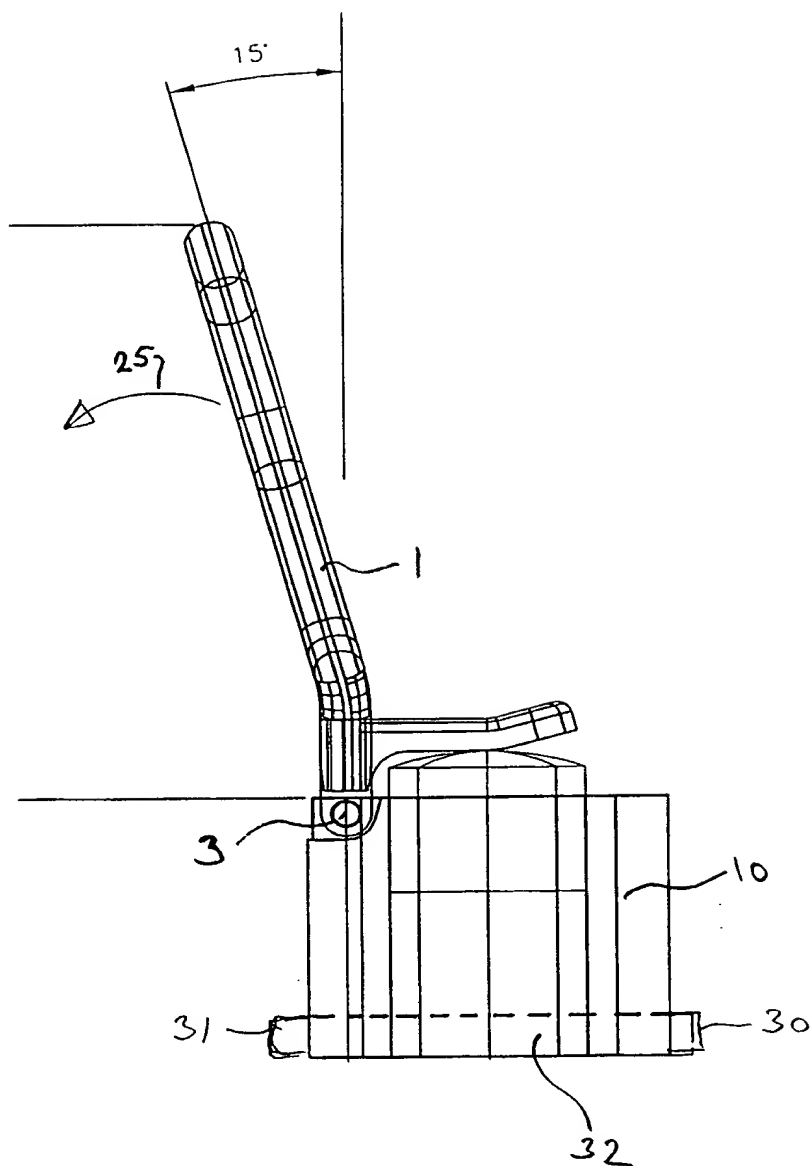


Fig. 2

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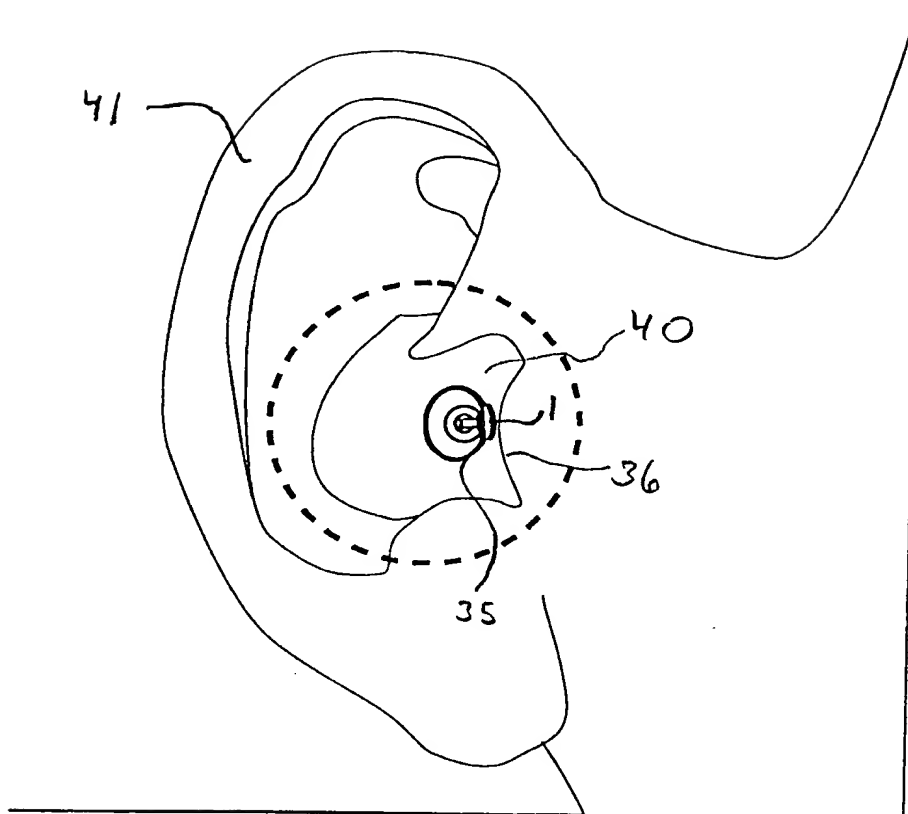


Fig. 3

INTERNATIONAL SEARCH REPORT

I. National Application No

PCT/DK 99/00485

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04R25/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04R H01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 347 584 A (NARISAWA) 13 September 1994 (1994-09-13) column 2, line 5-8	1-8, 10, 14, 18
A	column 3, line 13-26 column 4, line 9 -column 7, line 33 ---	9, 11-13
Y	WO 96 13961 A (SIEMENS HEARING INSTRUMENTS) 9 May 1996 (1996-05-09) page 2, line 9-27	1-8, 10, 14, 18
A	page 3, line 2 -page 4, line 13 ---	9, 11-13
A	US 5 600 728 A (SATRE) 4 February 1997 (1997-02-04) abstract column 4, line 5-63 column 5, line 30 -column 6, line 40 column 6, line 60 -column 7, line 25 --- -/--	1, 3, 13-17

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/DK 99/00485

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>GB 2 030 003 A (TEKTRONIX) 26 March 1980 (1980-03-26) page 1, line 5-10 page 1, line 26-88 page 1, line 104 -page 3, line 40 -----</p>	1,4,8-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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22 JAN. 2001

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 21738 PC 1	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DK99/00485	International filing date (day/month/year) 15/09/1999	Priority date (day/month/year) 24/09/1998
International Patent Classification (IPC) or national classification and IPC H04R25/02		
Applicant MICROTRONIC A/S et al.		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 13/04/2000	Date of completion of this report 18.01.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer De Vries, J Telephone No. +49 89 2399 8949 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK99/00485

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

Description, pages:

1-9 as originally filed

Claims, No.:

1-18 as received on 11/12/2000 with letter of 11/12/2000

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK99/00485

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☒ paid additional fees.
☐ paid additional fees under protest.
☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☒ not complied with for the following reasons:
see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1 - 18
	No:	Claims
Inventive step (IS)	Yes:	Claims 1 - 18
	No:	Claims

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK99/00485

Industrial applicability (IA) Yes: Claims 1 - 18
 No: Claims

2. Citations and explanations
 see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/DK99/00485

Re Item IV

Lack of Unity

The Application includes two inventions in the claim groups 1 to 17 and in claim 18.

The separate groups of inventions are :

Claims 1 to 17 : Pertain to a hearing aid comprising an operation mode control means adapted to be responsive to a force applied to a part of an auricle of the user.

Claim 18 : Pertains to a hearing aid comprising a means for manually controlling and removing the hearing aid from the ear.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1). Claims 1 to 17

a). Claim 1 pertains to a hearing aid which has a housing and a means for controlling an operation mode of the hearing aid. The controlling means are adapted to be responsive to a force applied to a part of an auricle of an ear of a hearing aid user.

b). In the prior art :

i). D1 shows a hearing aid in which a cable extends from the hearing in the ear which cable is sufficiently stiff to operate a rotor potentiometer and thus allow the user to adjust the volume while the hearing aid is in the ear.

ii). D2 : US-A-5 347584 shows a hearing aid with a means for controlling the ON/OFF mode by actuating a knob that can be lifted and turned but which is not responsive to a force applied to the auricle.

A howling prevention fixture is attached to a portion of the hearing aid which confronts the external auditory miatus of the wearer. The howling prevention fixture is fixed to the hearing aid housing so as to avoid stretching of its parts or that any of it remain in the ear when the hearing aid is taken out of the ear.

c). Therefore none of the prior art documents from the Search Report appear to show or hint at a control means actuated by providing force to an auricle of the ear.

d). Thus independent claim 1 and dependent claims 2 to 17 appear to meet the requirements of Articles 33(2) and (3) PCT.

2). Claim 18

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/DK99/00485

a). Claim 18 pertains to a hearing aid to be located in the ear canal with a means of removing it manually from the ear.

b). In D1 : WO-A-96 13961 a hearing aid is shown which has an elongated flexible cable (18) with an enlarged end to aid gripping .

The member of claim 18 differs from D1 in that it is stiff and is adapted to remain in relatively the same position during normal deflection of the stiff member.

The cable of D1, when operated by the user is rotated (see claim 1 of D1) which does not indicate that it moves from its original position.

However, no specific information is given about the cable position. On page 2 lines 9 to 24 it says that the flexible cable is rotated to adjust the volume and that it projects out of the housing and out of the ear canal such that a patient may grasp the cable.

c). Therefore as it is not clear from document D1 or from the other prior art in the Search Report that the cable is stiff enough and adapted to remain in essentially the same predetermined position at least during normal movements of the ear, claim 18 appears to meet the requirements of Article 33(2) and (3) PCT.

Re Item VII

Certain defects in the international application

1). The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

2). It should be noted that the application should relate to one invention only (Rule 13.1)

3). Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

CLAIMS

1. A hearing aid comprising, a housing and means for controlling an operation mode of the hearing aid, characterised in that said controlling means are adapted to be responsive
5 to a force applied to a part of an auricle of an ear of a hearing aid user.
2. A hearing aid according to claim 1, wherein the housing is adapted to be placed at a position behind the ear, and wherein the controlling means comprise sensing means positioned on at least one side of the housing facing the head or facing the ear lobe of the
10 user, the sensing means being adapted to sense a force applied to the user's auricle, and the controlling means being responsive to the sensing of the sensing means.
3. A hearing aid according to claim 1, wherein the housing is adapted to be placed within an ear canal of the ear.
15
4. A hearing aid according to claim 3, wherein the controlling means comprise a stiff lever having two ends, one of which is attached to a face part of the housing, the lever being adapted to be deflected by application of the force to the auricle, such as to a tragus, of the ear, and the controlling means being responsive to the deflection of the lever.
20
5. A hearing aid according to claim 4, wherein the lever is adapted to also be used by the user to remove the hearing aid from the ear canal.
6. A hearing aid according to claim 5, wherein the lever further comprises engaging
25 means adapted to facilitate engagement with the hearing aid during removal.
7. A hearing aid according to claim 6, wherein the engaging means comprises a loop-shaped or hook-shaped part.
- 30 8. A hearing aid according to any of claims 4-7, wherein the controlling means comprises switching means adapted to control the operation mode of the hearing aid, the switching means being responsive to the deflection of the stiff lever.
9. A hearing aid according to claim 8, wherein the switching means comprises a
35 momentary switch.

10. A hearing aid according to claim 8, wherein the switching means comprises an on/off switch.

5 11. A hearing aid according to any of claims 4-10, wherein the stiffness of the lever is large enough to convey at least a pressure force of 5,0 Newton to the switch element.

12. A hearing aid according to claim 11, wherein the pressure force is applied perpendicular to the length axis of the lever.

10

13. A hearing aid according to claims 9-12, wherein said switching means are adapted to switch an electrical signal between two predetermined levels, the controlling means being adapted to control the operation mode in response to a change in the electrical signal level provided by the switching means.

15

14. A hearing aid according to any of claims 1-13, wherein the controlling means are adapted to control a power on/off operation mode of the hearing aid.

15. A hearing aid according to any of claims 1-13, wherein the controlling means are adapted to select a particular pre-set listening program between a number of pre-set listening programs in the hearing aid.

20

16. A hearing aid according to any of claims 1-13, wherein the controlling means are adapted to control a telecoil/microphone operation mode of the hearing aid.

25

17. A hearing aid according to any of the preceding claims, wherein the controlling means further comprises an integrated circuit.

18. A hearing aid adapted to be positioned within an ear canal of an ear of a user, the hearing aid comprising means for manually removing the hearing aid from the canal, the removing means being fastened to the hearing aid and extending from the hearing aid toward an auricle of the ear, characterised in that the removing means comprise a stiff member adapted to remain in essentially the same predetermined position at least during normal deflection of said stiff member. ~~movements of the user.~~

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CLAIMS

REPLACES BY
ART. 34 AMDT

1. A hearing aid comprising, a housing and means for controlling an operation mode of the hearing aid, characterised in that said controlling means are adapted to be responsive
5 to a force applied to a part of an auricle of an ear of a hearing aid user.
2. A hearing aid according to claim 1, wherein the housing is adapted to be placed at a position behind the ear, and wherein the controlling means comprise sensing means positioned on at least one side of the housing facing the head or facing the ear lobe of the
10 user, the sensing means being adapted to sense a force applied to the user's auricle, and the controlling means being responsive to the sensing of the sensing means.
3. A hearing aid according to claim 1, wherein the housing is adapted to be placed within an ear canal of the ear.
15
4. A hearing aid according to claim 3, wherein the controlling means comprise a stiff lever having two ends, one of which is attached to a face part of the housing, the lever being adapted to be deflected by application of the force to the auricle, such as to a tragus, of the ear, and the controlling means being responsive to the deflection of the lever.
20
5. A hearing aid according to claim 4, wherein the lever is adapted to also be used by the user to remove the hearing aid from the ear canal.
6. A hearing aid according to claim 5, wherein the lever further comprises engaging
25 means adapted to facilitate engagement with the hearing aid during removal.
7. A hearing aid according to claim 6, wherein the engaging means comprises a loop-shaped or hook-shaped part.
- 30 8. A hearing aid according to any of claims 4-7, wherein the controlling means comprises switching means adapted to control the operation mode of the hearing aid, the switching means being responsive to the deflection of the stiff lever.
9. A hearing aid according to claim 8, wherein the switching means comprises a
35 momentary switch.

10. A hearing aid according to claim 8, wherein the switching means comprises an on/off switch.

5 11. A hearing aid according to any of claims 4-10, wherein the stiffness of the lever is large enough to convey at least a pressure force of 5,0 Newton to the switch element.

12. A hearing aid according to claim 11, wherein the pressure force is applied perpendicular to the length axis of the lever.

10

13. A hearing aid according to claims 9-12, wherein said switching means are adapted to switch an electrical signal between two predetermined levels, the controlling means being adapted to control the operation mode in response to a change in the electrical signal level provided by the switching means.

15

14. A hearing aid according to any of claims 1-13, wherein the controlling means are adapted to control a power on/off operation mode of the hearing aid.

15. A hearing aid according to any of claims 1-13, wherein the controlling means are
20 adapted to select a particular pre-set listening program between a number of pre-set listening programs in the hearing aid.

16. A hearing aid according to any of claims 1-13, wherein the controlling means are adapted to control a telecoil/microphone operation mode of the hearing aid.

25

17. A hearing aid according to any of the preceding claims, wherein the controlling means further comprises an integrated circuit.

18. A hearing aid adapted to be positioned within an ear canal of an ear of a user, the
30 hearing aid comprising means for manually removing the hearing aid from the canal, the removing means being fastened to the hearing aid and extending from the hearing aid toward an auricle of the ear, characterised in that the removing means comprise a stiff member adapted to remain in essentially the same predetermined position at least during normal movements of the user.

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PCT

REQUEST 15 SEP. 1999

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference 21738 PC 1
(if desired) (12 characters maximum)

Box No. I TITLE OF INVENTION

A hearing aid adapted for discrete operation

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Microtronic A/S
Bylledet 12-14
DK-4000 Roskilde

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:
Denmark

State (that is, country) of residence:
Denmark

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

JØRGENSEN, Martin Bondo
Lupinhaven 36
DK-2765 Smørum

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:
Denmark

State (that is, country) of residence:
Denmark

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

Plougmann, Vingtoft & Partners A/S
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DK-1021 Copenhagen K

Telephone No.

+ 33 63 93 00

Facsimile No.

+ 33 63 96 00

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AT Austria and utility model | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria | |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic and utility model | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany and utility model | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark and utility model | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> EE Estonia and utility model | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> FI Finland and utility model | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> SK Slovakia and utility model |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IS Iceland | |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> ZA South Africa |
| | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KR Republic of Korea | Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet: |
| <input checked="" type="checkbox"/> KZ Kazakhstan | <input checked="" type="checkbox"/> CR Costa Rica |
| <input checked="" type="checkbox"/> LC Saint Lucia | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> LK Sri Lanka | <input type="checkbox"/> |

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM					<input type="checkbox"/> Further priority claim indicated in the Supplemental Box
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:			
		national application: country	regional application: regional Office	international application: receiving Office	
item (1) 24 September 1998 (24.09.99)	PA 1998 01206	DK			
item (2)					
item (3)					

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): 1)

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / EP	Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority): <table style="width: 100%;"> <tr> <td>Date (day/month/year)</td> <td>Number</td> <td>Country (or regional Office)</td> </tr> <tr> <td>17 June 1999</td> <td>RS 102423</td> <td>DK</td> </tr> </table>	Date (day/month/year)	Number	Country (or regional Office)	17 June 1999	RS 102423	DK
Date (day/month/year)	Number	Country (or regional Office)					
17 June 1999	RS 102423	DK					

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets: request : 3 description (excluding sequence listing part) : 9 claims : 2 abstract : 1 drawings : 3 sequence listing part of description : Total number of sheets : 18	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): Standard search report RS 102423 DK
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Figure of the drawings which should accompany the abstract:	Language of filing of the international application: English
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Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Copenhagen, 15 September 1999

Plougmann, Vingtoft & Partners A/S

Jan Simonsen

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

Date of receipt of the record copy by the International Bureau:	For International Bureau use only
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